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ELEVENTH ANNUAL MEETING
1935-1936

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HAWAIIAN ACADEMY OF SCIENCE

The Hawaiian Academy of Science was organized July 23, 1925, for "the promotion of research and the diffusion of knowledge."

The sessions of the Eleventh Annual Meeting were held in Dean Hall, University of Hawaii, November 14 and 15, 1935, and May 14 and 15, 1936, ending with banquets at the Pacific Club on November 16 and May 16.

OFFICERS

1935-1936

President, Chester K. Wentworth
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PROGRAM OF THE ELEVENTH ANNUAL MEETING

THURSDAY, NOVEMBER 14, 1935, 7:30 P. M.

Dr. Andrew W. Lind: The cost of island civilization.

Mr. Edward Y. Hosaka: Floristic and ecological studies in Kipapa Gulch, Oahu.

Miss Carey D. Miller and Mrs. Ellen Masunaga: A study of the diet of sampan fishermen while at sea.

Dr. Royal N. Chapman and Miss Bertha Hanaoka: Predatory habits as causes of fluctuations in insect population.

Dr. T. A. Jagger: Instrumental methods at the Volcano Observatory.

FRIDAY, NOVEMBER 15, 1935, 7:30 P. M.

Mr. Austin E. Jones: Earthquakes and earth movements at Kilauea Crater, first half of 1935. (Presentation by title only.)

Mr. R. J. Baker: Some social aspects of American cities. (Presentation by title only.)

Mr. Charles S. Judd: The airplane in forestry. (Presentation by abstract.)

Dr. C. Montague Cooke, Jr.: The extinction of the Mangareva land shell fauna. (Presentation by abstract.)

Mr. F. R. Fosberg: A study of the Hawaiian genus, *Gouldia.*

Dr. C. J. Hamre and Miss C. D. Miller: The influence of splenectomy on recovery of nutritional anemia rats.

Miss Ruth Robbins and Miss C. D. Miller: Variation in calcium and chloride content of papayas grown at different altitudes.

Dr. Roswell H. Johnson: A preliminary study of sex education in Hawaii.

THURSDAY, MAY 14, 1936, 7:30 P. M.

Preliminary announcements.

Election of members.

Appointment of committees.

Presentation of papers:

Miss Carey D. Miller and Dr. Francis G. Benedict: Basal metabolism of normal young men and women of various races in Hawaii.

Mr. Edward Y. Hosaka: Phytogeography and ecology of Oahu. (Presentation by abstract.)

Dr. W. W. Krauss: A German-Japanese family—a study in race biology.

Dr. Stephen B. Jones and Mr. Rolland Bellair: Koppen and Thornthwaite classification applied to Hawaiian climates. (Presentation by title.)

Mr. F. R. Fosberg: Flora of Vostok Island.

Dr. Harold St. John and Mr. F. R. Fosberg: Flora of Flint Island.

Dr. C. H. Edmondson: Studies of fouling organisms in Kaneohe Bay.

Dr. M. B. Linford: Capture and destruction of nematodes by Hawaiian field and garden fungi.

Mr. Bruce Cartwright: Recording our ancestors.

FRIDAY, MAY 15, 1936, 7:30 P. M.

Dr. Harold S. Palmer: Geology of Lehua and Kaula.

Mr. K. R. Kerns and Dr. J. L. Colliins: The uses of acetylene to stimulate flower formation—a technique in pineapple breeding.

Mr. Otto Degener: Pages from a new illustrated flora of the Hawaiian Islands.

Dr. T. M. Livesay: Racial comparisons in performance on the American Council of Psychological Examination.

Dr. Peter H. Buck: Stock taking in ethnology. (Invitational paper.)

SATURDAY, MAY 16, 1936, 6:30 P. M.

Pacific Club banquet.

Constitutional order of business.

Installation of new officers.

Presidential address: Modern bench-forming processes on Oahu shores.

Adjournment.

ABSTRACTS OF PAPERS

MODERN BENCH-FORMING PROCESSES ON OAHU SHORES

(Presidential Address)

By

CHESTER K. WENTWORTH

Four chief bench-forming processes are distinguished: (1) wave quarrying, (2) wave abrasion, (3) water-level weathering, (4) solution benching. The level at which the deepest landward cut, or nip, is formed by wave quarrying is thought to depend not only on the profile of equilibrium against wave attack, but on the height of the zone of alternate wetting and drying as determined by splash vigor, and on the failure of supporting water pressure above a certain level. Wave abrasion is closely dependent on hard debris fragments for tools. Water-level weathering is not a primary cliff-notching process but smoothes and levels earlier benches at any level spray can reach. It is probably due to the physical effects of wetting and drying and is chiefly displayed on tuff formations. Solution benching is the result of the solution pitting of reef formations down to the level at which sea water regularly washes over the rock. The level thus set is higher on exposed points, lower in protected places. The chemical basis of the solution is not yet fully determined; land and rain water probably are important, but organic factors may enter in and there is some evidence of effects of agitation on the carbon dioxide content, and hence solution capacity of the sea water. This process forms strikingly level benches one to four feet above sea level on calcareous reef rock or sandstone coasts. Much work remains to be done on the exact physical and chemical character of each of these modern processes before it is possible to accurately interpret ancient cut benches.

THE COSTS OF ISLAND CIVILIZATION

By

ANDREW W. LIND

Judged by the more obvious criteria of western civilization such as public health and education, Hawaii rates high, particularly among the tropical colonial areas of the world. Infant mortality reached a low level of 64.5 per thousand live births in 1935, which compares favorably with the 1934 rate of 59.9 in the Birth Registration Area of continental United States. It

was very much lower than the rates of any of the comparable colonial areas or of the regions from which Hawaii's labor population emigrated. Hawaii's ratio of literacy in the population 10 years of age and over (84.9 percent in 1930) exceeds that of all other major plantation areas.

These achievements of civilization, apparently requisite for full participation in the American commonwealth, have occasioned financial expenditures which are likewise considerably greater than those of comparable colonial areas. In 1930, the per capita outlay for public education reached the high figure of $15.19. The alleged moral costs of island civilization, due to the misplaced expectations of youth seeking preferred positions in a closing economic order, are probably normal where pecuniary standards are so greatly emphasized. Social malaise and personal disorganization, due to the misplaced expectations again, are universal in areas with an extensive experience under the capitalistic system. Thus far Hawaii has been spared the more serious overhead costs of civilization. Ratios of arrests and convictions for the more serious types of crimes are considerably lower here than in continental United States. Striking differences between the rates of dependency, delinquence, and insanity and the corresponding charges upon the community of the several racial groups vary according to the length of residence, abnormalities of age and sex distributions, and the stage achieved in the assimilative process. In general the latest arrivals cost the community the most. The Porto Ricans per capita constitute an exceptionally heavy charge upon the community, while the Japanese and Chinese cost least.

FLORISTIC AND ECOLOGICAL STUDIES IN KIPAPA GULCH, OAHU

By

EDWARD Y. HOSAKA

By the principles of the relation of nature to man, conservation is not merely a matter of food but it is the only means by which man can deliberately prolong the life of his civilization. To obtain some light on the problems of conservation of soil and vegetation, Kipapa Gulch was chosen and the floristic, climatic and edaphic data were collected.

Kipapa Gulch can be divided into six distinct vegetational zones, namely the Maritime, Lowland, Guava, Koa, Ohia, and Summit Zones. The Maritime Zone is characterized by the *Batis-Scirpus* association and the vegetation is heterogeneous. The Lowland is characterized by the growth of xerophytic plants. This zone is classified as *Opuntia-Acacia-Heteropogon* Association, and the vegetation is nearly homogenous. The vegetation of the

Guava Zone is characterized by the uniform stand of *Psidium Guayava* and *Lantana Camara.* The area is classified as *Psidium-Lantana* association, and the vegetation is homogeneous. The most characteristic features of the Koa Zone are the pure stands of *Acacia koa, Aleurites Moluccana* and *Gleichenia linearis.* This area is classified as *Koa* association, and the vegetation is homogeneous. The Ohia Zone is classified as *Ohia* association, and the vegetation is homogeneous. Above 2,000 feet elevation an open low scrubby, moss-covered vegetation is found with no single dominant species, and the vegetation of this zone is heterogeneous.

In working up the floristic composition of the gulch, only the endemic, indigenous and naturalized introduced species were considered.

Figure 1. The floristic composition of Kipapa Gulch.

Plants	No. of species
mosses	34
Pteridophytes	75
Angiosperms	334

Figure 2. Summary of the flora of the different zones.

Species	Maritime	Lowland	Guava	Koa	Ohia	Summit
Endemic	2	8	12	35	194	144
Indigenous	13	12	24	28	43	14
Introduced	26	64	70	21	23	9

As to the problem of plant succession, the Maritime Zone is stable except for the drier places where *Prosopis juliflora* is coming in. The Lowland Zone is stable; Guava Zone, stable; Koa Zone, unstable; Ohia Zone, stable; and Summit Zone, unstable.

(This paper is listed for publication by Bernice P. Bishop Museum.)

PHYTOGEOGRAPHY AND ECOLOGY OF OAHU

By

EDWARD Y. HOSAKA

The understanding of the vegetation of any region is important since the knowledge of the status of vegetation could be profitably used as a guide to the future utilization of the land. Each region is a distinct combination of geology, climate and topography, and results in a characteristic set of soil types. As a result a region will have a characteristic vegetation and the

understanding of the plants could be used as an index to various agricultural possibilities.

In the Hawaiian islands very little work has been done on phytogeography. The islands could be divided into several climatic regions and these regions seem to have their own types of plant associations with definite life forms. The plants in Haiku Valley and Kipapa Gulch point to these conditions.

A STUDY OF THE DIET OF JAPANESE SAMPAN FISHERMEN WHILE AT SEA

By

CAREY D. MILLER AND ELLEN MASUNAGA

In order to make the study, we secured the cooperation of the operators of five sampans. There were four men on each sampan making a total of twenty men. The ages ranged from 17 to 65. Some of the men were born in Hawaii, some in Japan, and fishing had been their occupation from two to forty years. It was possible to secure exact records regarding the kind, quantity, and cost of foods taken for three consecutive trips to sea. The duration of the trips was from 11 to 13 days. One man on each boat kept a record of the quantity of fish eaten and of any food that was left when they returned. The height and weight of the men were known and their energy expenditure was based on a detailed twenty-four hour record of their activity on the boats.

Using the data collected, the intake of various food constituents was calculated. The calories, protein, phosphorus, and iron were found to be adequate and the calcium and vitamin B inadequate. The calcium was only about half of the recommended standard and the calcium-phosphorus ratio was 4:1 instead of 2:1. The vitamin-calorie ratio calculated by the Cowgill method was 1.3, whereas it should have been 1.65. A list of foods was then prepared to provide a diet which was adequate in every respect with the calcium and vitamin B greater than the standards. In general, legumes and vegetables were stressed and the men were urged to take more evaporated milk.

It was believed that the muscular pains from which a number of the men suffered might be due, at least in part, to the inadequacy of their diet, and consequently, they were greatly interested in improving the diet if it did not mean increased cost. It was not possible to make an exact check six months after the experiment ended, but we found they were using more vegetables, more legumes, and more milk than they had previously used.

METHODS OF THE HAWAIIAN VOLCANO OBSERVATORY

By

T. A. JAGGAR

(Hawaiian Volcano Observatory, Volcano Letter 434, 435, 437, 1936.)

The work since 1911 has centered about the recording, quantitatively, of the physical changes at a crater, always aiming to see underground. Three main projects have resulted: (1) discovering earthquake origins, (2) measuring secular strain, and (3) measuring gas emission, probably hydrogen. The projects have in view the forecasting of eruptions.

(1) Mr. Jones' study (University of Hawaii Research Publication No. 9) shows a sample of our earthquake record book, and the method of using locally determined travel times, in order to map and profile highly localized earthquake origins.

(2) Mr. Wilson's study (University of Hawaii Research Publication No. 10) shows the elevation and opening of angles from 1912 to 1921; the opposite from 1921 to 1927. The work was critically done with a precise level and transit.

(3) Mr. Jaggar's study (Annual Address, Hawaiian Volcano Research Association, Honolulu, 1924) makes a systematic forecast for the Mauna Loa flow expected (and arriving) about December 1935, with the average interval, migration of vents, seismometric data and intensity in the past for criteria.

The tools have been seismographs, shock recorders and annunciators, tiltmeters, cameras, weather instruments, pyrometers, gas collectors, borings and time-keepers checked by radio. All assistance has been volunteered.

GROUND SURFACE DISPLACEMENTS AND EARTHQUAKES AT KILAUEA, HAWAII, FIRST HALF OF 1935

By

AUSTIN E. JONES

Various measurements that have been carried on at the Hawaiian Volcano Observatory are examined for accuracy. The errors are $\pm$ 2 mm for precise levels; $\pm$ 38 mm or $+$ 2″ of arc for angles; and $\pm$ 6″ of tilt for seismographic measurements. The crack points in the floor of the crater are about 0.2 mm in error. The cracks measured weekly are compared with the angle, level and tilt measurements, with the anomalous result that the crack opening

appears least when the angles show the greatest opening. A better result was obtained in a direct comparison to days of tilt-determined crustal elevation and depression. Here there was a much more rapid crack opening with 3 to 7 days elevation than there was with 10 to 20 days depression.

Measurements of angles between the crater walls and levels of the crater floor are not interchangeable methods of measuring crustal movement. During the period of examination the points on the crater floor continually sank with to and fro motions of the crater walls. This has led to the explanation that craters are areas that sink more rapidly than does the surrounding country. Levels are undoubtedly useful outside the crater.

The small percentage of located shocks appears to have little to do with the movements studied, though the frequency of all shocks does. Several seismicity curves were constructed. Seismographic tilt determinations of crustal elevation and depression are best; angle and luni-seismic methods are second and third best. Angle measurements cannot be made at close enough intervals of time, while luni-seismic methods are inherently bad in that several days may elapse after the initiation of a crustal movement before it can be shown in the studies. A daily local earthquake maximum for the six months period comes when the sun is over the eastern Pacific. The above is a separation based upon tilt. With a separation based upon the luni-seismic determination of crustal movement, no difference in the daily curves can be found. In the period under study and with the methods used, days of crustal uplift appear as seismic as days of crustal depression. From the foregoing it appears that a seismographic cellar, properly equipped and located on the slopes of an active volcano, is as good an all-around instrument as the volcanologist can obtain.

SOME SOCIAL ASPECTS OF AMERICAN CITIES

By

JEROME BAKER

Changes of far-reaching consequences and of profound significance have been, in the recent past, and still are taking place in American cities. There is evidence that industry is decentralizing, moving to less costly sites and less congested areas. Traditionally, industry has clung to centers of population and accessible reservoirs of labor. Electric power and improved transport has made it possible to move industry to less crowded locations.

Economic conditions arising out of the recent depression have brought about a series of important social changes. Populations, always moving,

changing and making readjustments, have been particularly restless during this trying period. Families of unemployed or partially employed workers have doubled up or moved to the country, thus causing vacancies and depressed real estate values. Apartment house owners who have built or refinanced their properties during boom times, are unable to meet principal and interest payments with lower rents and fewer apartments rented. Pretentious real estate projects which have been developed in suburban areas, far beyond immediate needs and absorbing useful agricultural land, have been abandoned and their shoddily laid out streets and cement walks have become overgrown with weeds. New and successful office buildings are considered fortunate if seventy-five percent filled, while older and less attractive ones may be from one third to one half filled with tenants. Gangsterism and large scale robbery as a social phenomenon has become conspicuous, and armored trucks for transporting valuables have become a familiar sight. The park benches are filled with those in ill health, deficient strength or skill, or for other reasons unable to stand the industrial strain, unemployed or unemployable, homeless,—and the community evades its social responsibility by leaving them sitting there.

Pictures to illustrate this talk consisted of the great office buildings of Chicago and New York, industrial subjects, street traffic, shopping areas, street markets in the East Side of New York and Maxwell Street of Chicago, armored trucks, negroes seeking employment in the north, mounted police and dwellings in stable and disorganized communities.

THE AIRPLANE IN FORESTRY

By

C. S. JUDD

In the rapid development of the use of airplanes for commercial purposes, such as the speedy carrying of passengers, mail, and articles of commerce and for war maneuvers, foresters have not been slow in adopting them for forestry purposes.

Among these may be classed the taking of vertical aerial photographs for the preparation of topographic maps showing forest limits and forest types, a detection of forest fires and the rapid transportation of fire fighters and supplies to burning areas, the searching for lost parties, the transportation of building materials for mountain cabins, and the sowing of seed on areas in need of reforestation.

The first observed results of the use of airplanes for sowing seed in Hawaii originated on July 2, 1926, when Assistant Forester L. W. Bryan

in three flights in a Loening amphibian generously supplied by the U. S. Army, scattered from an elevation of 1500 feet, 600 pounds of seed of 35 different species of forest trees on a recent 700-acre burn in the Panaewa forest near Hilo. Less than two years later Mr. Bryan discovered 24 *Melochia indica* trees from 3 to 10 feet high and one *Lagerstroemia speciosa* 18 inches high, the undoubted results of this seed sowing from the air.

On Oahu, 31 flights dating back to May 28, 1922, have been made by the U. S. Army in cooperation with the Experiment Station of the H.S.P.A. under the immediate direction of Forest Supervisor G. A. McEldowney and approximately nine tons of seed have been scattered from the air over forest regions on this island.

Results of this sowing observed thus far show at least four tree species established in this manner: African tulip 10 feet high, Moreton Bay fig, 8 feet high, *Barringtonia asiatica,* 6 seedlings 14 inches high, and Java plum, 10 plants 2 feet high occurring on two acres from seed dropped 3 years previously.

The most spectacular results have been secured on Kauai from the seed dropped from the Fokker plane C-2, generously supplied by the Army on November 15, 1929 when Assistant Forester A. W. Duval in three flights liberated 1,686 pounds of tree seeds at an elevation of 2,000 feet over western Kauai. In September of this year, some CCC boys prospecting for new trails through the Alakai swamp, discovered about 400 trees of the New Zealand Karaka tree from 5 to 8 feet high growing in a narrow strip through the swamp. These undoubtedly are the result of the sowing made six years previously.

The results noted above prove that reforestation by airplane seed sowing is feasible when the seed finds a favorable germinating bed. For every day use, however, this method is not practical because of the high cost of operating airplanes and the waste of the huge quantity of expensive seed which does not find a favorable site for germination.

EXTINCTION OF LAND SHELL FAUNAS OF THE MANGAREVA ISLANDS

By

C. MONTAGUE COOKE, JR.

Nearly a dozen species belonging to six or seven genera of endemic land shells have been reported from the Mangareva Islands. A few of these species were alive in the late 60's or early 70's of the nineteenth century. Due to the destruction of practically all the native forests the endemic land

snails have been almost entirely wiped out. None of these endemic species were found alive when we visited these islands in 1934. Two new endemic species were found on the face of one of the southern cliffs, where only a few dozen native trees exist today.

Fortunately, on four of these islands and islets rich fossil beds containing recent land snails were found by our party. These beds were five to eight feet above sea level, and the shells were embedded in a mixture of beach sand and soil from a few inches to one or two feet below the surface of the ground. Most of the species in these beds probably belong to new subgenera peculiar to this group of islands. From these specimens it is clear that this group of islands had at one time a highly endemic shell fauna distinct from any other faunas inhabiting other groups of islands in this portion of the Pacific.

THE INFLUENCE OF SPLENECTOMY ON RECOVERY OF NUTRITIONAL ANEMIA RATS

By

C. J. Hamre and C. D. Miller

In 1935, the authors published their observations on changes of the spleen induced in nutritional anemia rats by the feeding of adequate supplements of copper and iron or other supplements containing adequate quantities of those elements. The spleen was found to become temporarily enlarged during the recovery period and while in the enlarged condition to be transformed into an erythropoietic organ. Both the enlargement and the erythropoietic process disappeared as the normal blood conditions were reached. This suggested that the spleen was an important factor in recovery of erythrocytes and it was decided to determine to what extent erythrocyte recovery was due to that organ, and in what ways it might influence the recovery of the animals in general.

Twenty-five albino rats were made anemic by being placed on an exclusive diet of milk. When they had developed severe anemia, they were divided into two groups of thirteen and twelve animals. The first group was splenectomized and fed daily doses of 0.5 mg. iron in the form of ferric chloride, and 0.25 mg. copper in the form of copper sulphate in addition to the basal milk diet. The second group of anemic animals was submitted to operation but the spleen was not removed. This group was then fed similar quantities of copper and iron to induce recovery from the anemia. White and red blood cell counts and hemoglobin determinations were made daily

for each animal. Blood smears and differential counts of nucleated cells were also made daily.

Growth and hemoglobin recovery were similar and nearly identical for the two groups of animals. Erythrocyte recovery was slightly retarded for the splenectomized group though complete recovery was not prevented by removal of the spleen. The greatest difference between the two groups was found in the number of nucleated cells of the blood stream. Large numbers of nucleated cells appeared on the second and fifth or sixth day of recovery for both groups of animals. The number of nucleated cells on the second day was much greater for the splenectomized group than for the control group, the average number of cells for the two groups being 44,000 and 15,000. The number of nucleated cells appearing on the fifth or sixth days of recovery was also greatest for the splenectomized animals, the average being 16,000 and 10,000.

A differential study of the nucleated cells of the blood smears showed that the great increase of cells was due to increases of neutrophiles and lymphocytes and the appearance of large numbers of normoblasts in the blood stream, the latter in some animals constituting more than 50 percent of the total number of nucleated cells. This suggested that the removal of the spleen had unstabilized the hemopoietic system, for normoblasts appeared in small numbers only in the control group and never are found in the blood under normal conditions. The results indicate that the spleen acts as a check or stabilizer on the bone marrow causing the latter to liberate only mature erythrocytes into the blood stream. Since normoblasts disappear from the blood of splenectomized animals on continued recovery, it is suggested that some other hemopoietic organ assumes the function of the spleen in preventing the liberation of immature cells by the bone marrow.

VARIATION IN THE CALCIUM AND CHLORIDE CONTENT OF PAPAYAS FROM KNOWN REGIONS

By

RUTH COBURN ROBBINS AND CAREY D. MILLER

Seven samples of papayas grown in known regions of the Hawaiian islands were collected and analyzed at the nutrition laboratory of the University of Hawaii. The moisture, total ash, calcium, and chloride content of the fresh material was determined by standard methods. For comparison, the results were recalculated to the dry basis, yielding the following figures:

The calcium and chloride content of papayas from known regions (calculated on the dry basis)

Source of Sample	Ash percent	Calcium percent	Chloride percent
Kailua uplands, Oahu	3.19	0.106	0.284
Wahiawa, Oahu	3.31	0.118	0.292
Kaneohe uplands, Oahu	3.09	0.107	0.423
Kona, Hawaii, 1500 feet	2.87	0.104	0.432
Puualoa, Oahu	3.54	0.132	0.792
Kauai	5.22	0.089	0.902
Wailupe, Oahu	8.05	0.299	1.703

On the fresh basis, the calcium content varied from 0.010 percent to 0.026 percent with an average of 0.016 percent, which indicates that papaya is a good fruit source of calcium in the diet.

The chloride content of these papayas on the fresh basis varied from 0.037 percent to 0.147 percent. The upper figure is near that published for milk, bananas and other "unsalted" foods. Sweet potatoes and oranges are also known to vary even more in chloride content, so this variation is not excessive. In view of the fact that recent vitamin tests at the nutrition laboratory show papayas to be an excellent source of vitamins A and C, and the average chloride content to be no greater than that of many other fruits and vegetables, there appears to be little foundation for the belief that papaya should be excluded from a salt-free diet. Because of its general excellence, wider use of the papaya is recommended.

(This paper is listed for publication in the Biochemical Journal.)

BASAL METABOLISM OF NORMAL YOUNG MEN AND WOMEN OF VARIOUS RACES IN HAWAII

By

CAREY D. MILLER AND FRANCIS G. BENEDICT

(Med. Soc. of Hawaii, Trans., 40th Ann. Mtg., 1936.)

As part of the world-wide survey of basal metabolism fostered by the Nutrition Laboratory of the Carnegie Institution of Washington, located in Boston, tests have been made during the past six years on various racial groups in Hawaii. The work has been supported by the Carnegie Institution of Washington and the University of Hawaii.

The Benedict "field respiration apparatus" was used for all tests. The subjects slept at home and came to the laboratory each morning without breakfast and rested from 30 to 40 minutes before the tests were made. Three, and occasionally four tests were made on each subject in one morning; the average of two or three that agreed best being used as representing the basal metabolism for that day. Tests were made on two different days, usually not more than two weeks apart. If the results of the tests on two different days did not agree within 5 percent, a third test was made with few exceptions.

For each subject the following data were secured: previous diet, hours of rest and sleep, physical activity the previous day and evening, mouth temperature, blood pressure, height, weight, sitting height, birth date, birthplace, length of living in Hawaii, and parentage. Every care was taken to eliminate apprehension and nervousness.

The majority of the subjects were students at the University of Hawaii. The aim was to secure subjects who were born in Hawaii or who had lived here most of their lives.

A chart was presented that summarized a portion of the data for 237 subjects—115 men and 122 women—between the ages of 18 and 30 for the following racial groups: Japanese, Chinese, Caucasian, Chinese-Hawaiian, and Hawaiian mixtures.

The average figures for all racial groups showed a minus deviation from the Harris-Benedict prediction as follows: for men, Caucasian, -6.6; Japanese, -2.8; for women, Caucasian, -7.9; Chinese, -15.0; Chinese-Hawaiian, -13.7; Hawaiian Mixed, -7.3; and Japanese, -10.8.

All females showed a greater minus deviation than the males. Of the female group, the Chinese showed the greatest deviation from the prediction standards, which confirms previous work of Benedict and co-workers that Chinese women have a definitely lower basal metabolism than Caucasian women. In 1928, Benedict suggested that the prediction standards for women should be lowered by about 5 percent. The data given above show that even if this were done, women of all races in Hawaii tend to show a low metabolism.

The averages for the men all show a minus deviation less than 10 percent, but because they are all in the direction of minus values, it would appear that men in Hawaii tend to have a basal metabolism somewhat lower than normal if present prediction standards are correct.

A detailed report of this work will be published by the University of Hawaii.

A GERMAN-JAPANESE FAMILY IN HONOLULU
A STUDY IN RACE BIOLOGY

By

WILHELM W. KRAUSS

The German-Japanese family, Kufferath, consists of the German father, Carl Theodor Jakob Kufferath (72 years), the Japanese mother, Shin Hori (63 years), and eleven children, six sons (23-38 years) and five daughters (32-42 years).

The father is the son of a musical director in northwest Germany; the mother is the daughter of a baron's steward and belonged to the low nobility (Shizoku class) of Japan.

The cross family was founded in Japan in 1893 and moved to Germany, Tasmania, Japan and, in 1910, to Hawaii.

The father was formerly a clerk and is now a piano tuner. All the children are small professionals.

Except the youngest two sons, all the children are or were married. Their husbands, or their wives respectively, are two white North Americans, two Portuguese, four white-Hawaiian crosses and one Japanese-white cross.

There are only five grandchildren, two boys and three girls, among them, however, only one grandson of the male line.

The three generations are mostly Protestants; only the eldest two sons, the wives of three sons, and one granddaughter are Catholic.

Many measurements of head and body were taken, and the most important qualitative characteristics (colors, morphology) were observed. The psychical quantities were stated according to Ernest Kretschmer's "Psychobiogramm", simplified by the author. Scientific photographs were taken of the single members. Only the eldest two daughters living on the American mainland could not be measured.

The father seems to be a Nordic-Alpine hybrid (Nordic: tall stature, 5 feet, 10 inches; Alpine; dark eye and hair color, broad, short head—cephalic index 83,67, low face—morph. face index 78,52[1]); his body build seems to be predominantly leptosomous.

The mother (small stature, 4 feet, 10 inches, short skulled—cephalic index 82,80) shows the narrow and high-faced Japanese Chosiu type (morph. face index 94,07); her body build seems to be pyknic.

The children: eye and hair colors are very dark, more like the mother's. Intermediate between the parents are: skin color, stature and morph. face index. The cephalic indices of all the children examined are higher (83,85-94,89) than those of the parents.

[1] Small resorption of lower jaw.

The strong Mongoloid fold of the mother occurs only in one son; another son has hardly any Mongoloid fold (like father); the other children show different variations of the Mongoloid fold.

Three sons look predominantly "Europoid" (deep-lying eyes, Europoid nose and cheek profiles), one son predominantly Mongoloid, another son and the daughters show about intermediate types.

Of the constitutional types both the leptosomous (two sons, one daughter) and the pyknic (one daughter) occur, while the other children represent intermediate types.

The parents and the children seem to be of predominantly schizothymous character; only one of the daughters seems to possess a strong cyclothymous component.

A coincidence of body build and temperament in the sense of Kretschmer was observed, the three most leptosomous children being the most schizothymous, the pyknic one showing the pronounced cyclothymous note.

A characteristic of the whole family seems to be "tenacious will."

No "hybrid vigour" ("Luxurieren") could be found.

The father's German and the mother's Japanese environmental influences on the children are insignificant; the children show about the same type of behaviour as the white Americans of the same social group.

KOPPEN AND THORNTHWAITE CLASSIFICATIONS APPLIED TO HAWAIIAN CLIMATES

By

STEPHEN B. JONES AND ROLLAND BELLAIRE

Quantitative classification provides a means of comparing climates and of studying relationships of climate to vegetation and agriculture. Applied to the island of Oahu, the Koppen system is found unsatisfactory, because the classification is based largely upon temperature and seasonal distribution of rainfall, whereas total precipitation seems to be the outstanding distinction between different parts of the island. Because "precipitation-effectiveness" and "temperature-efficiency" are treated separately but concurrently, the Thornthwaite system gives a better representation of the climates of Oahu. However, the Thornthwaite system requires modification, in two respects, for application to Hawaiian climates. First, seasonal distribution of temperature-efficiency must be expressed, in order to distinguish the nearly isothermal Hawaiian climates from middle-latitude climates having similar total temperature-efficiency with high summer concentration. Thornthwaite provided for

this factor but did not employ it on his maps. Second, it is found that evaporation under very rainy conditions differs greatly from that of the interior United States, upon which Thornthwaite based his equation for precipitation-effectiveness. The coefficient of the Thornthwaite equation must be increased by amounts varying from 40 to 400 percent. This increase is consistent with results obtained by Forbes, in an application of the Thornthwaite system to Atlantic coastal stations, and by Isozaki, in an application to the climates of Japan.

With the foregoing modifications, maps of the four larger islands of the Hawaiian group are constructed. These maps show fifteen climatic types, including every precipitation type except "arid" and every temperature belt except "perpetual frost." Reasonable correspondence with forest areas is observed, considering the wide spacing of stations in some parts and the many factors, other than climate, that affect vegetation distribution. The "BB'ra" climates seem to be favored for pineapple culture. Unirrigated sugar cane is found in "A" climates or in the rainier parts of "B" climates.

(This paper is listed for publication in the Geographical Review.)

VEGETATION OF VOSTOK ISLAND, CENTRAL PACIFIC

By

F. Raymond Fosberg

Vostok Island, lat. 10° 06′ S., long., 152° 23′ W., is a tiny, isolated, flat coral island. Although the Mangarevan Expedition of the Bernice P. Bishop Museum in 1934, was unable to land, a careful examination with powerful binoculars revealed no other vegetation than a dense forest of *Pisonia grandis*. In 1935, Captain W. J. Anderson landed on the island and spent several hours in a careful examination of the vegetation. He brought back and turned over to me specimens of the only two plants which he found. The island, with the exception of the beach, is entirely covered by a forest of *Pisonia grandis* R. Br., so dense that almost no sunlight can penetrate. The ground between the great trees is covered to a considerable depth with dried leaves.

Just outside the forest, at the top of the beach, are a few plants of the prostrate *Boerhaavia diffusa* Linnaeus. The leaves of some of the specimens of *Boerhaavia* are infested with white rust, *Albugo* sp. The extreme paucity of the flora is remarkable, even for a coral island.

A STUDY OF THE HAWAIIAN GENUS, GOULDIA

By

F. RAYMOND FOSBERG

Gouldia, the *"manono"* of the Hawaiians, is one of the three commonest genera of Rubiaceae in the Hawaiian forests, and one of the important constituents of the forest cover in many areas.

In all probability the genus is endemic to the Hawaiian islands, although a species has recently been assigned to it from New Guinea. I have not had access to the type specimen of this species, but from the description I would judge that it did not belong in *Gouldia.*

This investigation has brought out the fact that there are only three distinct species in the genus. One of these species, *Gouldia terminalis,* has a large number of varieties and forms, differing only in minor vegetative characters.

Hybridism, both between species and lesser divisions seems to be common wherever the ranges of two or more forms overlap. This complicates the taxonomy of the genus.

One species is confined to the Koolau Range of Oahu, and to Lanai. Another is found on Molokai, Maui and Hawaii, with a different variety on each. The other, *Gouldia terminalis,* has varieties on the six major islands. Of these the Kauai varieties are rather distinct from those of the other islands, but rather closely related among themselves. Several closely related series of varieties run through the other islands.

With my present understanding of the genus, no phylogenetic arrangement is possible. The only suggestion as to its past history is that there may have been several widely distributed types in the past, which have differentiated into many local variations, these having subsequently become more widely distributed.

The evident relationship of *Gouldia* is with the genus now known in the Hawaiian islands as *Kadua.* It has probably been derived from *Kadua* at a rather remote period in the past.

Gouldia is much in need of further collecting, especially on islands other than Oahu. I will be glad to attempt to identify any specimens submitted to me.

(This paper is listed for publication by Bernice P. Bishop Museum.)

VEGETATION OF FLINT ISLAND, CENTRAL PACIFIC

By

HAROLD ST. JOHN AND F. RAYMOND FOSBERG

(B. P. Bishop Mus., Occ. Papers, vol. XII, no. 24, 1937.)

Flint Island, lat. 11° 25′ 43″ S., long. 150° 48′ W., is a small, isolated, flat coral island. Plants were collected there by the Mangarevan Expedition of the Bernice P. Bishop Museum in 1934.

The original vegetation of the island has been almost completely destroyed, and the island is entirely devoted to raising copra. Little can now be ascertained concerning the original distribution of the plants, as the planting has eliminated most of the individuals of many species and doubtless some species in their entirety. Of the 36 species of plants collected 13 are apparently indigenous, 13 are cultivated, 9 are recently introduced weeds, and one was possibly introduced by the ancient Polynesians.

STUDIES OF FOULING ORGANISMS IN KANEOHE BAY

By

C. H. EDMONDSON

Investigations of the fouling organisms in Kaneohe Bay, Oahu, have been carried on for more than a year, the object being to study their rate of growth, their life cycles, their periods of maximum development, and to gain as much information as possible about their habits and behavior. For collecting the organisms panels of wood, metal, glass and composition materials of various kinds have been used. Colored plates of glass and panels coated with commercial paints both non-toxic and toxic have also been utilized. The station established in Kaneohe Bay is at the end of the pier extending for a quarter of a mile into the bay from the Fish and Game Farm of the Territorial Board of Agriculture and Forestry on Mokapu Peninsula. The principal groups of fouling organisms found here are similar to those reported wherever work of this nature has been carried on. Barnacles, bryozoa, serpulid worms, certain mollusks, hydroids and ascidians prevail among the animals, and algae among the plants. Each locality, however, has its peculiarities with respect to the kinds of fouling organisms prevailing there. Differences are to be seen, both in quality and quantity, between the organisms of Kaneohe Bay and those of the leeward side of Oahu where observations have been made.

Seasonal variations are also observed. Each of the principal groups of fouling organisms shows periods of maximum development alternating with periods of depression. At times all have shown rapid growth and again all have been retarded. During the spring of 1935 the accumulation of organic material on panels in Kaneohe Bay was noticeably greater than for the corresponding period of 1936. For the first three months of 1936 there was a marked lack of fouling by all of the organisms, recovery from this depression being indicated only during the latter part of April.

It is known that larvae of barnacles just before attachment are negatively phototropic and attracted by dark surfaces, if non-toxic. The nature of the phototropism of other fouling organisms at the time of attachment is unknown. The efficiency of numerous anti-fouling paints and compositions is being tested. At the time of this report it can be stated that the toxicity of some of the paints employed is sufficiently lost in from 10 to 12 weeks to permit the attachment of some kind of fouling organism. Although there does not seem to be a solution of the problem at this time, it is suggested that a record of the responses of the larvae of each of the principal fouling organisms to a considerable number of highly toxic chemical agents may be a step in the right direction.

CAPTURE AND DESTRUCTION OF NEMATODES BY HAWAIIAN FIELD AND GARDEN FUNGI

By

M. B. LINFORD

Beginning late in 1935, fungi have been investigated by me as natural enemies of plant parasitic and free-living nematodes in soil. During this time, over two dozen distinct fungi have been found which destroy nematodes in devious ways. Eleven distinct forms, representing both Fungi Imperfecti and Phycomycetes, have been found capturing live nematodes, holding them, finally killing and digesting them, and using them as food. The remaining fungi are non-trapping parasites.

This paper deals with organs of capture and with the actual capture and destruction of nematodes by representatives of the eleven nematode-trapping fungi. Some of these fungi are identical with organisms observed and reported elsewhere, chiefly from the vicinity of Washington, D. C.; some of them appear new to science. None of the eleven has formerly been reported from Hawaii.

Three of these fungi capture nematodes in irregular nets composed of anastomosing hyphae with meshes of various sizes exposed at all angles.

Nematodes are caught, apparently by adhesion, when they enter a mesh. The fungus then penetrates the nematode through one or more points of adhesion, and grows through the nematode, digesting the internal organs.

Two fungi trap with simple rings borne on delicate stalks. Nematodes are caught when they thrust either head or tail into such a ring. They may be held fast, or may tear the ring from its stalk and carry it away as a tight-fitting necklace. In either case, the fungus grows from one of the three cells constituting such a ring, penetrates the nematode body, and digests its organs.

Five of the eleven fungi produce small spherical or ovoid adhesive cells at the tips of delicate stalks. Nematodes are captured by adhesion to such cells, and may be held fast or may tear these cells from their stalks. In either case, the fungus penetrates through the point of adhesion, killing and digesting the nematode. One of these fungi also bears simple rings.

Two fungi capture nematodes by adhesion to simple, straight hyphae. Again, the fungus penetrates through one or more points of adhesion, killing and digesting the captured nematode.

Fungi with similar types of trapping organs differ in details of traps, as well as in forms of conidia or other spores. For the most part, these fungi have not yet been identified specifically. One of the net trappers is *Arthrobotrys oligospora* Fresenius, and another is either identical with or very similar to *Stylopage hadra* Drechsler.

RECORDING OUR ANCESTORS

By

BRUCE CARTWRIGHT

A simple, compact, concise and elastic system of recording ancestors has been developed by Merton Goodrich, genealogist, of Keene, N. H. The person whose ancestry is being traced is given the numeral (1); his father (2). The number of every male ancestor is double that of the child. The mother is (3). Every female ancestor has the number of her husband plus 1, except where she is a second wife, then she takes a number double that of her child plus 1, while the father retains the first number assigned to him.

The data are assembled into sections called "lines". The number and name of each line is that of the mother with which it begins. If two lines have the same surname the mother's full name is used. Each line is divided into two parts. The summary shows on one page all ancestors of the line,

connections with other lines and most important dates and localities. A collection of summaries alone will form a family tree. The ancestors in a direct line are at the left. The father preceded by his number in parenthesis is directly below the child. The mother, preceded by m. and followed by her number, is set in about half an inch to the right just below the father. Dates of birth, marriage and death, and residence follow each name. Her number is a reference to her line.

The detailed accounts of each individual, origin of family, et cetera, form the second part of each line and are called "family history". An accepted separate page is assigned to each subject. Family trees without accepted reference are worthless.

The only equipment necessary is a loose-leaf binder and plain pages, to be written or typed on. Using this system the Cartwright line has been worked out.

THE GEOLOGY OF LEHUA AND KAULA

By

HAROLD S. PALMER

(B. P. Bishop Mus., Occ. Papers, vol. XII, no. 13, 1936.)

Through the courtesy of the U. S. Lighthouse Service I was enabled to travel on the tender *Kukui* to the rather inaccessible islets of Lehua and Kaula. Lehua is a mile north of the north end of Niihau, and Kaula is 23 miles southwest of the south end of Niihau.

Both are parts of the arcuate rims of basaltic tuff craters. Lehua, a lateral cone of Niihau, was built in three eruptive epochs separated by erosion intervals during which unconformities were made. During the second interval a reef grew in the crater and supplied limestone blocks to the last series of tuff. All three tuff series include a variety of basalt blocks torn from the walls of the volcanic conduit.

Kaula stands on a shoal, 5 by 8 miles, made by the bevelling of a lava dome. Kaula has two series of tuffs separated by one unconformity. The blocks are of the same varieties as those of Lehua, but also include some boulders of lava which are well rounded as if by wave erosion on the shoal.

Both islets have considerable amounts of a low, wave-cut bench along the more sheltered parts of their shorelines, but have very little bench on the exposed parts. Presumably this bench was cut at a time when the sea level was higher than now.

Lehua is 702 feet high and includes about 291 acres. Its crest line is

about 9,250 feet long and approximates closely to an arc of 260° of a circle of 1,975 feet radius. Kaula is about 540 feet high and includes about 136 acres. Its crest line is 5,500 feet long and approximates closely to an arc of 170° of a circle of 1,750 feet radius.

THE USES OF ACETYLENE TO STIMULATE FLOWER FORMATION: A TECHNIQUE IN PINEAPPLE BREEDING

By

K. R. KERNS AND J. L. COLLINS

Over 33 years ago the pineapple growers of the Azores Islands discovered that pineapple plants could be forced into flower by smudging their glass houses with smoke from burning trash. Later the same practice was used in Puerto Rico. Small areas of prematurely fruiting pineapple plants found in the plantations in Hawaii during 1930, and later, were attributed to trash having been burned to the windward side of these areas. In 1932 it was shown by Rodriguez at Cornell University, that ethylene gas could cause flowering. It was shown by the Pineapple Producers' Cooperative Association's Experiment Station in Hawaii that other members of the unsaturated hydrocarbons, namely, acetylene and propylene, would act also in this way. Acetylene, because of its relative inexpensiveness and ease of handling, was used in pineapple breeding to force into simultaneous flowering varieties which do not normally flower at the same time. After it had been used for some time for this purpose it was discovered that water saturated with acetylene, when applied to the plants, would also stimulate them into flowering. This change in the method of using acetylene had important results. It then became possible to treat large numbers of plants for the purpose of forcing flowering of plants on the plantations and to cause fruiting of the plants according to a predetermined schedule. It also furnishes a starting point for the attack upon a series of problems related to fruit formation and growth; problems which are distributed in the fields of pathology, physiology, chemistry and genetics.

PAGES FROM A NEW ILLUSTRATED FLORA OF THE HAWAIIAN ISLANDS

By

OTTO DEGENER

In reading various floras, we note cases where different writers have ascribed different names to the very same plant. There are two reasons: (1) outright errors and (2) differences of opinion. Hillebrand called the common prickly-pear *Opuntia tuna* instead of *O. megacantha*; and our native poppy, the Mexican poppy. These are mistakes in identification. I described and named a new *Schiedea,* carelessly neglecting to add a Latin diagnosis. As this is contrary to new rules of nomenclature the proposed name, instead of standing for all time, is relegated to obscurity. This was an error in technique. Evaluating differences of opinion is more complex.

A floristic work in general, and especially for an imperfectly known region like Hawaii, is unfortunately not a precise account of the diverse species, varieties, and forms growing within a given geographical area. It is rather a treatise expressing the author's opinion as to the categories into which the plants of his region belong. As all taxonomists (writer and reader excepted) are, according to botanical jargon, either "lumpers" or "splitters", a regional flora by a "lumper" contains fewer species than one written by a "splitter". Their opinions simply differ regarding the interpretation of what species, varieties and forms should be. (Hence to quibble about whether a little-known Hawaiian plant should be considered a species or a variety is a pedantic waste of time, particularly when so many others on the verge of extinction can yet be collected before it is too late.) No contemporary worker is qualified to decide this question—his criticism would simply express one more opinion that might or might not come nearer the truth. When we keep in mind the steady advance of taxonomy since 1753, the almost ephemeral duration of opinions regarding the placing of plants into various categories is striking. How many of the species studied by Linnaeus remain in the genera to which he assigned them—the majority have fled as the (L.)'s, standing for the father of Systematic Botany, found in parentheses after plant names prove! Systematic Botany simply has not yet reached its ultimate goal of being an exact science like Mathematics.

The Flora Hawaiiensis, being in loose-leaf form, allows for the correction of errors by replacement of obsolete pages. It concentrates on illustrated descriptions, on the present writer's opinion regarding the plant's status and, in the form of synonymy, on the opinions of disagreeing other workers. The advanced, critical student can thus choose from the long list of synonymy the name he considers correct. Others had better follow the writer, who trusts that time will substantiate his findings.

RACIAL COMPARISONS IN PERFORMANCE ON THE AMERICAN COUNCIL PSYCHOLOGICAL EXAMINATION

By

T. M. LIVESAY

This study presents data for 265 Caucasians, 178 Chinese, 292 Japanese, and 97 part-Hawaiians on racial differences in performance on the five subtests and total scores of the American Council Psychological Examination for the 1931, 1932, and 1933 editions used as an admissions criterion at the University of Hawaii.

The Caucasian group is superior to the other three groups in Completion, Analogies, Opposites, and Total Score; superior only to the part-Hawaiian group in Artificial Language.

The Chinese group is superior to the other three groups in Artificial Language and Arithmetic; superior to the Japanese and part-Hawaiian in Analogies, Opposites, and Total Score; and superior only to the Japanese in Completion.

The Japanese group is superior to the Caucasian and part-Hawaiian in Artificial Language, and superior only to the part-Hawaiian in Analogies, Arithmetic, Opposites, and Total Score.

The part-Hawaiian group is superior to the Chinese and Japanese in Completion and inferior to all the other in everything else.

The critical ratios indicate complete reliability of the differences in twenty of the thirty-six comparisons.

(This paper is listed for publication in the Journal of Educational Psychology.)

STOCK TAKING IN ETHNOLOGY

By

PETER H. BUCK

At a recent stock taking of the individual objects in the Polynesian collection of Bishop Museum, a fair number of errors was discovered. The errors affected not only locality but the use of the objects. An even worse condition with regard to Polynesian material exists in the museums of the United States and Europe. As ethnologists usually accept museum labelling, the museum errors have been perpetuated in ethnological literature. The distressing part is that no organized effort has been made to correct the errors

that are capable of being corrected. Unless stock taking is conducted in each ethnographical area with the assistance of experts, the errors will continue to exist indefinitely and so continue to be a source of danger to ethnologists who rightly consider that the ethnographical museums should be regarded as the laboratories of their science. Furthermore a science which uses erroneous material without checking its accuracy is in danger of losing its claim to be regarded as a science.

The erroneous information conveyed by inaccurately labelled museum artifacts applies also to ethnological literature. Theories constructed on wrongly localized artifacts are as houses built on shifting sand. Stolpe's theory that the geometrical patterns on the carved ceremonial adz hafts of Mangaia were due to degradation of the human form rested on carved human figures on Austral Islands paddles which were inaccurately labelled in the European museums as belonging to Mangaia. The Austral Islands paddles are still labelled as Mangaian or Hervey Islands in most museums and Stolpe's theory founded on this error is still accepted by most ethnologists.

The writings of early voyagers and missionaries who came into direct contact with a functioning native culture have often been blindly accepted without thought of checking the accuracy of the statements made. Many of those writers had had no scientific training as to the importance of accurate detail. Their vision had been focussed by their own cultural background and they wrote in terms of it. Even men who had had scientific training did not always accurately describe what they actually saw. Thus a Dr. Marshall in describing two Maori women weaving a cloak, stated that they worked the weft lines in from each end toward the middle. What really happened was that one woman worked the weft line from the left to the middle and the other woman took it on from there to finish it at the right border. Meanwhile the first woman commenced a new weft line on the left. The Maori technique did not admit of what Dr. Marshall thought he saw. Banks, the botanist with Cook's first expedition, accurately described an ornamental pin that he saw hanging from the shoulder of a Maori cloak. It was of curved bone with a hole at one end through which a piece of cord fastened it to the cloak. Stirred by admiration, he complimented the forethought of the Maori in carrying a threaded needle on his cloak with which to repair any tear that might accidentally occur. The sewing function was derived by Banks from his own culture for the ornament was never so used by the Maoris themselves. Banks evidently did not ask the Maori the use of the object. Why? Two reasons are apparent. First, the use was so obvious to Banks that he did not need vocal confirmation. Second, Banks could not ask because he did not know the language. The reasons sum up the causes of common errors in many of the early European writing. The

observer did not know the language and therefore rationalized from his own cultural background.

What applies to material objects becomes still more marked when subjects such as customs, social organization, and religion are involved. If the written statement does not fit into the cultural complex of which it is supposed to form a part, there is something wrong with the statement. If it does not check, it should not be accepted. Thus the statement that the ceremonial adzes of Mangaia were used to celebrate peace between warring tribes does not fit into the detailed account of the method of concluding war in Mangaia. One of many reasons is that the victorious tribe continued to hunt the remnants of the defeated tribe until they were so reduced in number that they could not recommence hostilities. It was not necessary to make peace with them and hence the peace-making function of a carved adz haft does not fit into the Mangaian cultural background.

The accepted statement in the literature that the Maoris ate the flesh of slain warriors or chiefs to acquire their inherent valor and prestige (*mana*) does not fit with the Maori psychology as I sense it. The victor proved his valor and greater prestige by conquering his enemy but he ate his flesh to degrade his enemy's family by converting the flesh of their leader into common food. The practice hinges on the antithesis between the sacred attributes of a chief (*tapu*) and the common nature of food (*noa*). The victor added to his prestige by killing his enemy and the enemy lost prestige through being eaten. Though the enemy was dead, his record lived on and the depreciation in prestige affected his family and his descendants.

Examples could be multiplied to show how unchecked statements in the literature are as erroneous as some of the labels on museum artifacts. The literature needs stock taking as much as do museum collections. Unchecked statements are a menace to accurate scientific study and so long as they are accepted, the status of ethnology as a science must remain open to question.

THE MAUNA KEA EXPEDITION

Early in 1935, plans were laid by several Academy members to establish, during August of that year, a camp near the summit of Mauna Kea which would serve as a base for studies of various natural features of the higher summit area. It was hoped that by combining forces in a cooperative camp it would be possible for botanists, geologists, and other naturalists, even during a period of two weeks only, to add greatly to scientific knowledge of this little known region.

While the preliminary discussions were being held the suggestion was made by H. A. Wadsworth, that the venture merited financial support by the Academy, and on his motion before the council the sum of $100 was

appropriated for it. At the same time it was stipulated that the project be known as the Hawaiian Academy of Science Mauna Kea Expedition and Chester K. Wentworth was appointed leader. Subsequently the Hawaiian Department of the U. S. Army, Parker Ranch, and C.C.C. officials in Honolulu and on Hawaii, as well as various other institutions, individuals, and territorial and federal agencies cooperated most cordially in making the expedition a success.

Transport and camp arrangements were supervised and carried on by an Army party of ten men under the command of Captain H. A. Meyer. Much of the early planning was done by E. H. Bryan, Jr. of the Bishop Museum. The summit camp at Lake Waiau was occupied by from four to eleven persons between August 6 and August 20th, and the station house at Humuula by an average of ten or twelve persons from July 29 to August 21st. A total of sixteen scientists took part in the work, including members of the federal soil survey party then at work on Hawaii. A brief narrative of the expedition has been published in the Mid-Pacific Magazine (vol. 48, pp. 291-296, 1935) and a general account of findings in various fields is practically completed. Members of the party, as well as other specialists to whom collections have been referred, are at work on a number of more technical reports, which will collectively constitute a substantial and fairly well rounded addition to knowledge of the summit area of Mauna Kea. The Mauna Kea Expedition proved so successful and met with such cordial interest and general assistance from various agencies that it is hoped that similar expeditions can be conducted to other regions in the future.

(The report is listed for publication by Bernice P. Bishop Museum.)

NECROLOGY

Gerrit Parmile Wilder, a member of a kamaaina family and a charter member of the Hawaiian Academy of Science, was born in Honolulu on November 5, 1863, and died in the city of his birth on September 29, 1935. He was one of Hawaii's leading horticulturists, and had devoted many years to the development and improvement of both ornamental and economic plants, notably hibiscus, mangoes and avocados. He introduced into Hawaii numerous varieties of breadfruit from Tahiti, and as a result of his many botanical explorations in the islands of the south Pacific as well as in the West Indies and other parts of the tropics the exotic flora of Hawaii has been greatly enriched. He published, a number of years ago, a beautifully illustrated work on the fruits of the Hawaiian Islands, and more recently his explorations furnished the material for his floras of several of the less well known islands of the south Pacific. He is survived by the widow.

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Wentworth, Edna C.
Westervelt, William D.
Westgate, John M.
Westgate, Mark
Whitney, Leo
Wicke, Henry A.
Willard, Harold F.
Williams, Frances E.
Williams, Francis X.
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